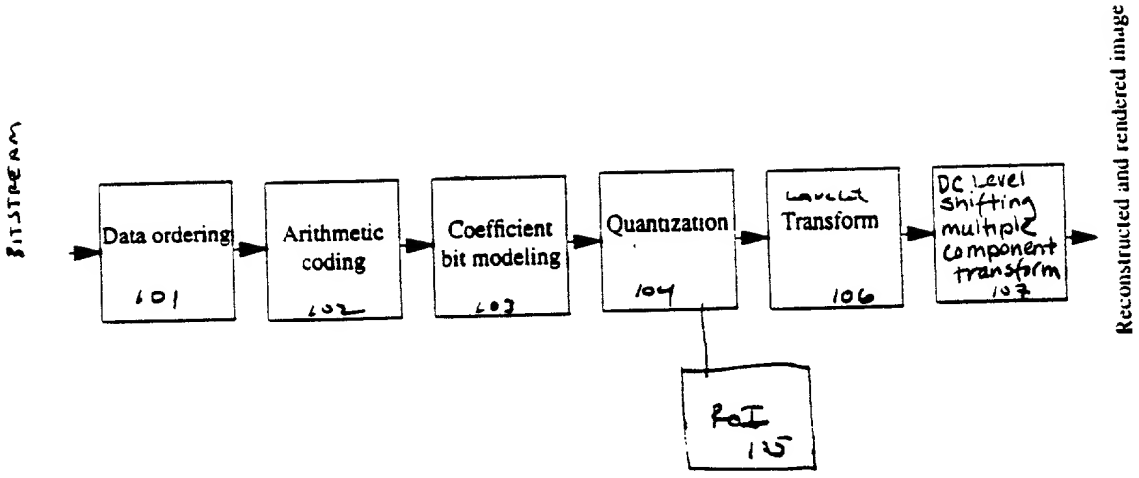

BITSTREAM
Data ordering
101
Arithmetic coding
102
Coefficient bit modeling
103
Quantization
104
Transform
106
DC Level shifting multiple component transform
107
ROI
105
Reconstructed and rendered image

Figure 1

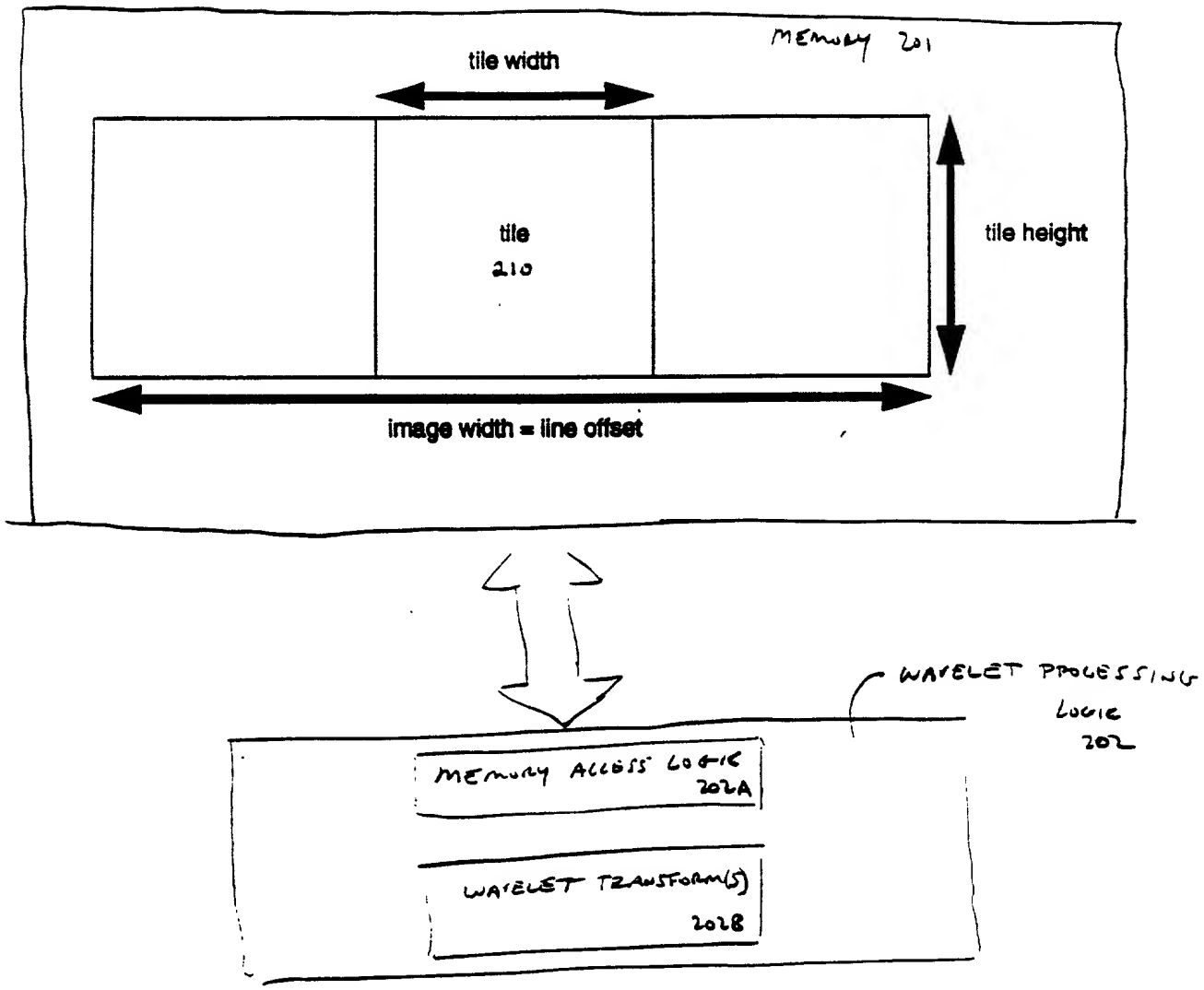
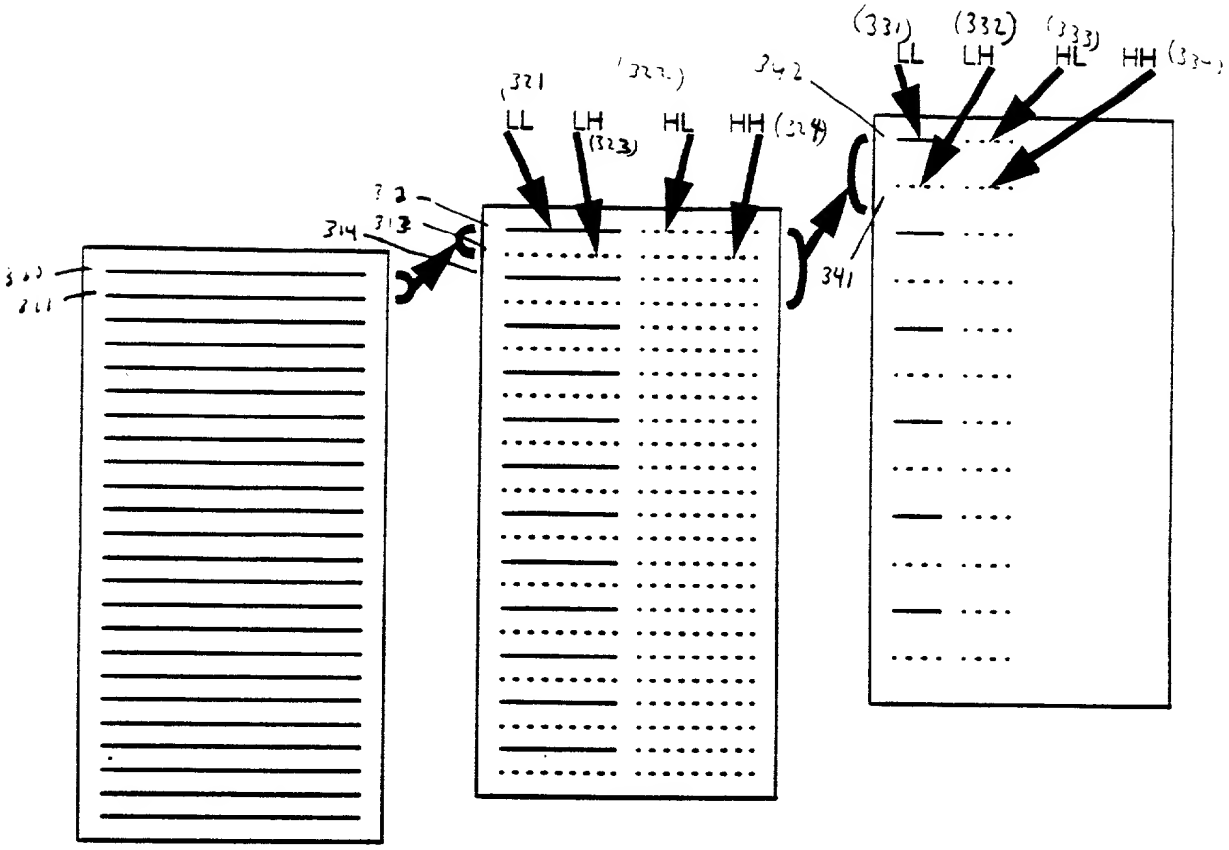

MEMORY 201
tile width
tile
210
tile height
image width = line offset
WAVELET PROCESSING
LOGIC
202
MEMORY ACCESS LOGIC
202A
WAVELET TRANSFORM(S)
202B

Figure2


(331)
(332)
(333)
LL
LH
HL
HH (334)
342
(321
LL
LH
(323)
HL
HH (324)
341
input 301
level 1 (302)
level2 (303)

(A) (B) (C)

Figure 3

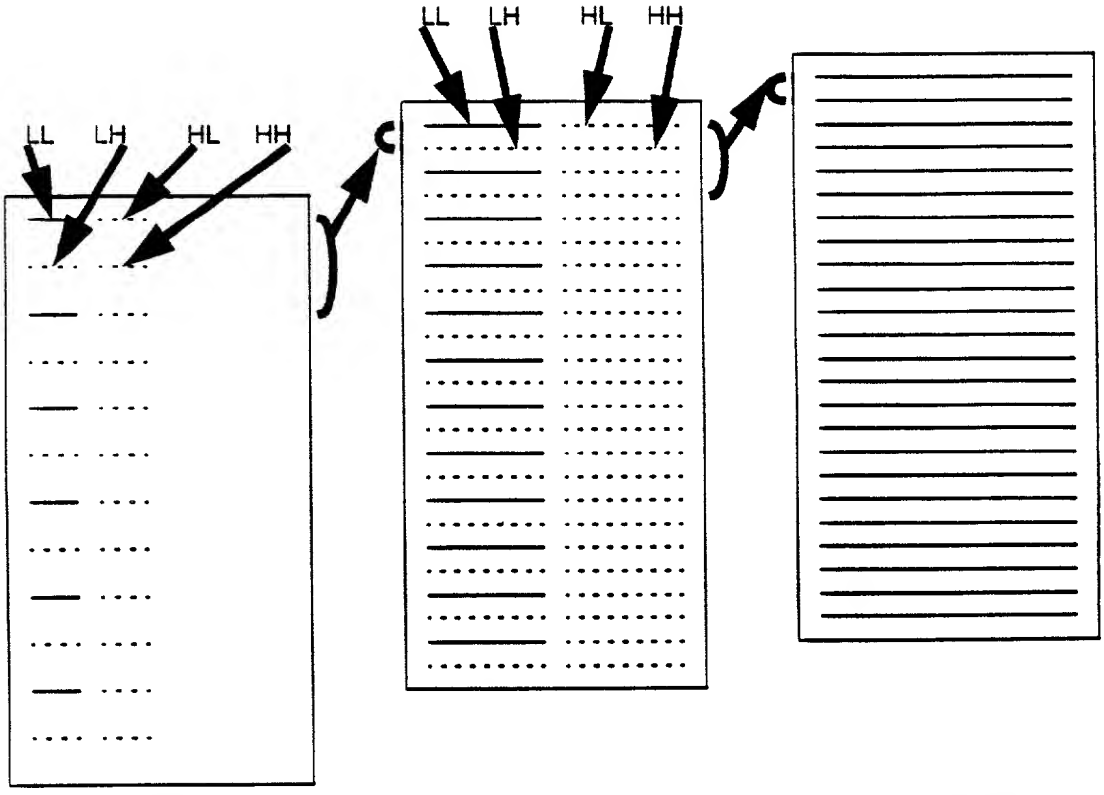


Figure 3.

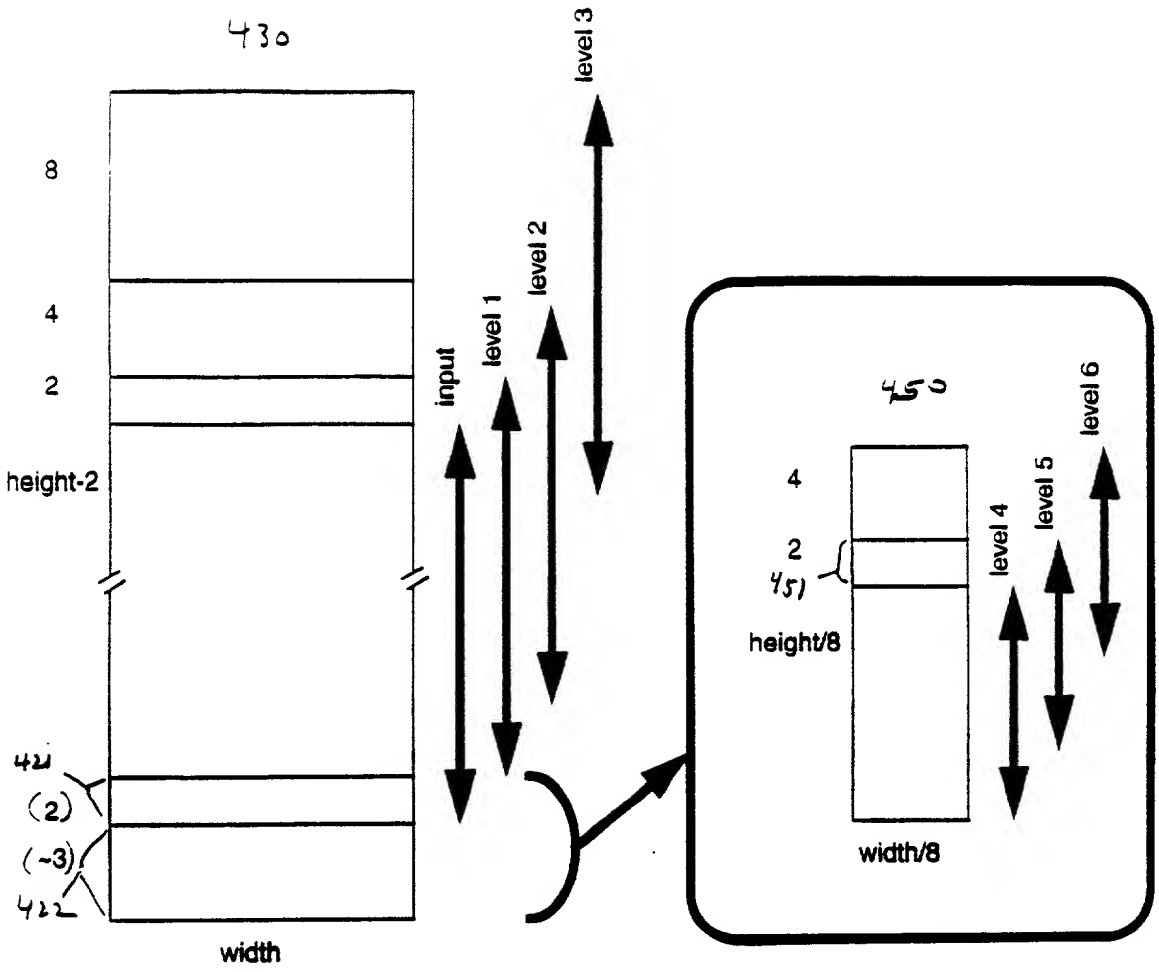

430
8
4
2
height-2
422
(2)
(-3)
422
width
input
level 1
level 2
level 3
450
4
2
451
height/8
width/8
level 4
level 5
level 6

Figure 4A

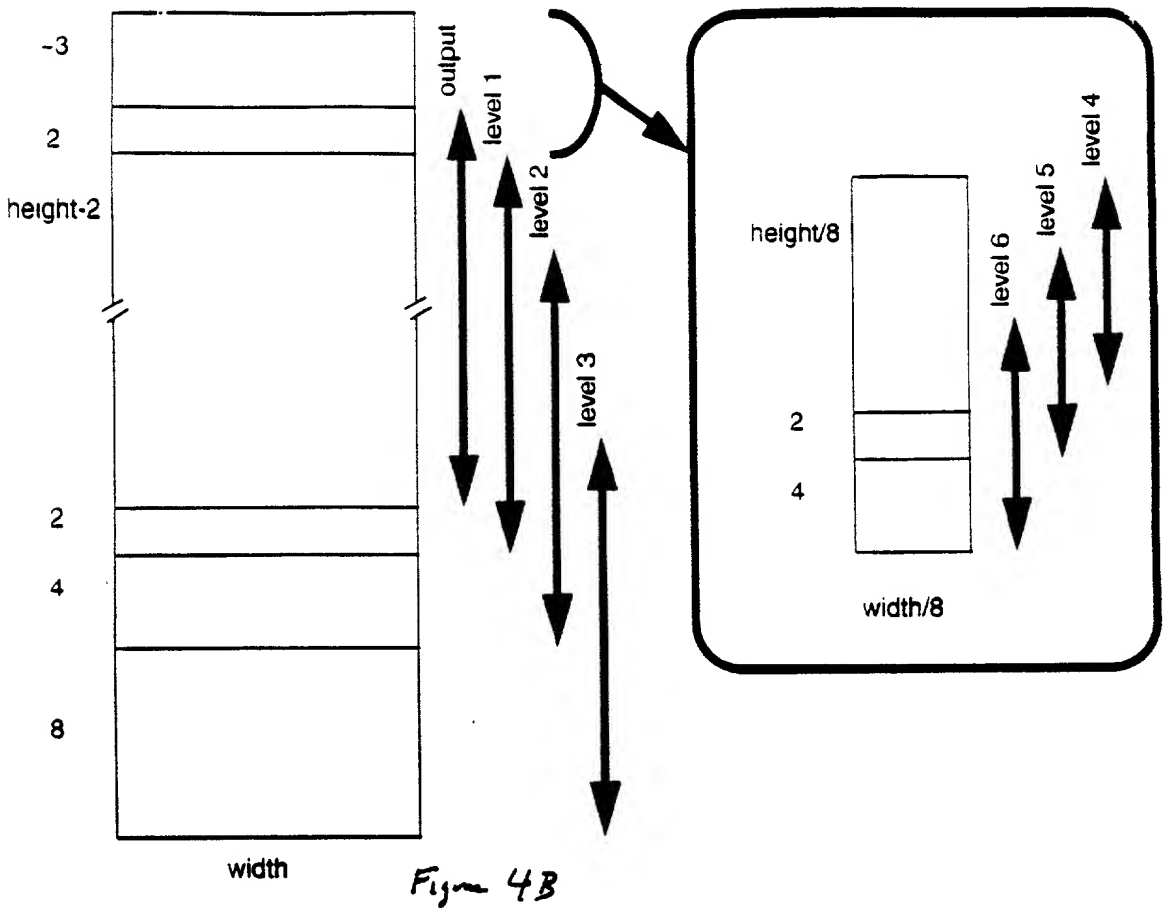

-3
2
height-2
2
4
8
width
output
level 1
level 2
level 3
height/8
2
4
width/8
level 6
level 5
level 4

Figure 4B

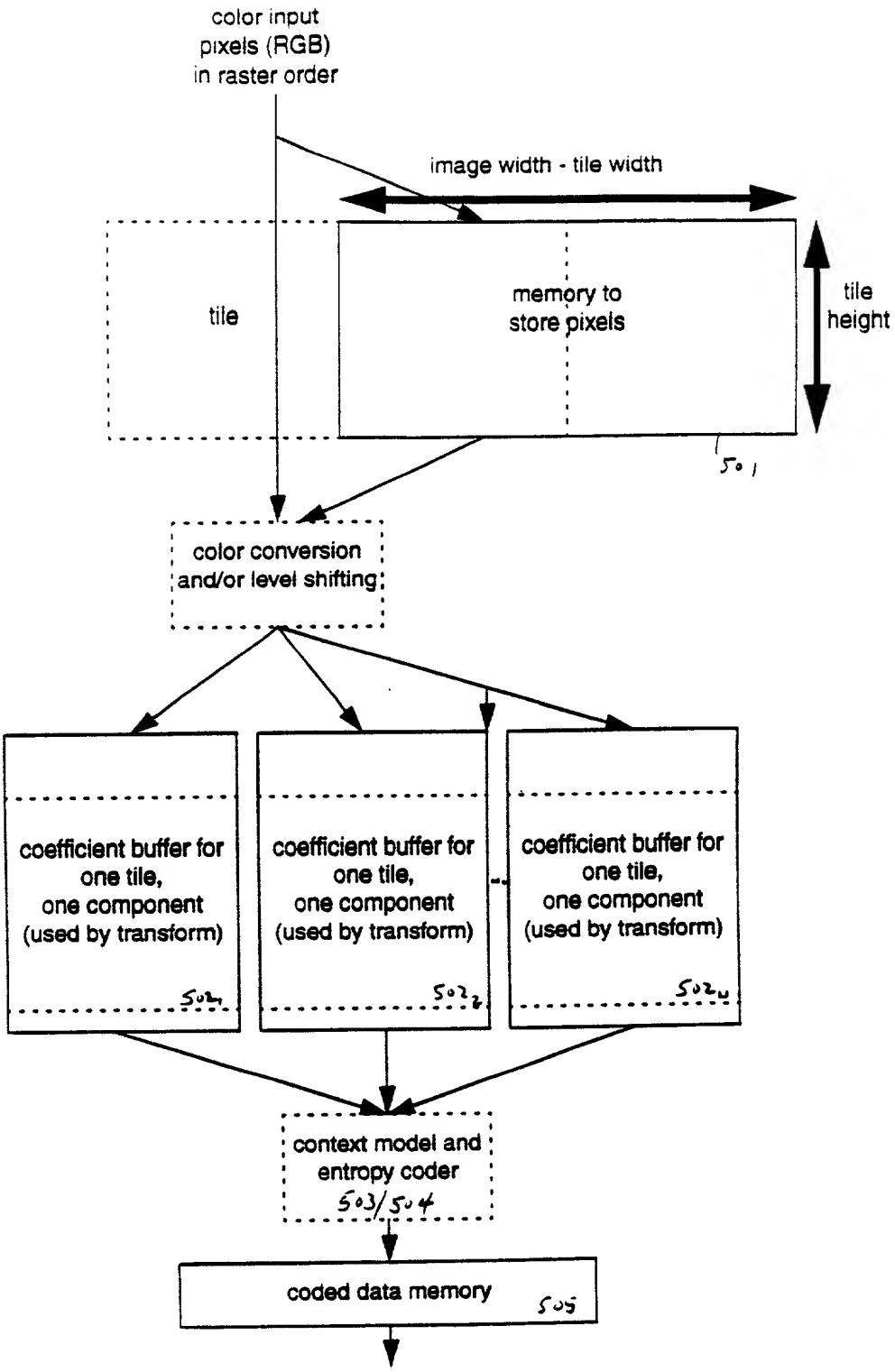

color input
pixels (RGB)
in raster order
image width - tile width
tile
memory to
store pixels
tile
height
501
color conversion
and/or level shifting
coefficient buffer for
one tile,
one component
(used by transform)
502₁
coefficient buffer for
one tile,
one component
(used by transform)
502₂
coefficient buffer for
one tile,
one component
(used by transform)
502ₙ
context model and
entropy coder
503/504
coded data memory
505

Figure 5

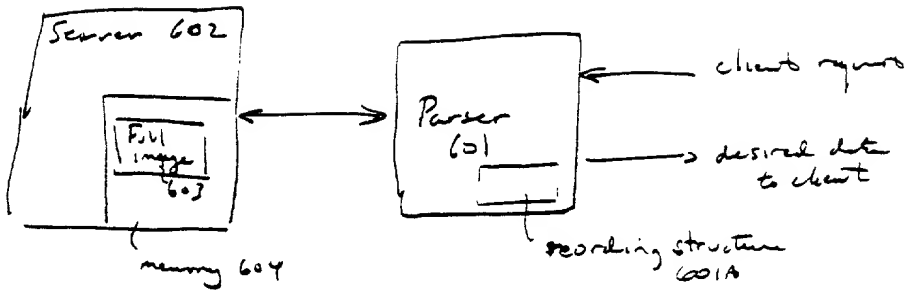


Figure 6A

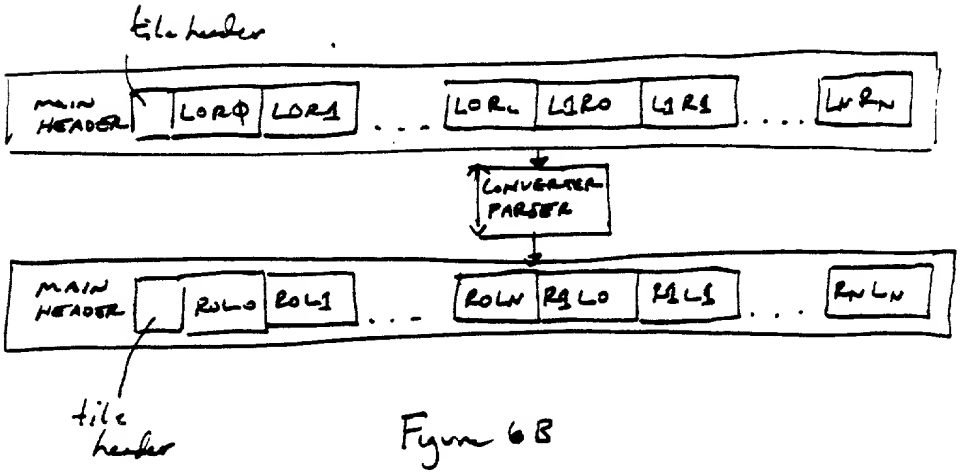


Figure 6B

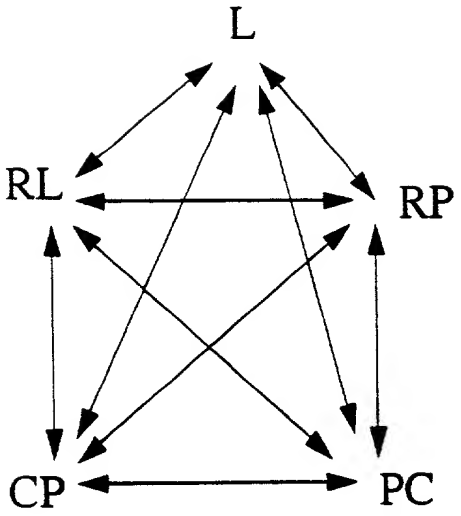


Figure 7A

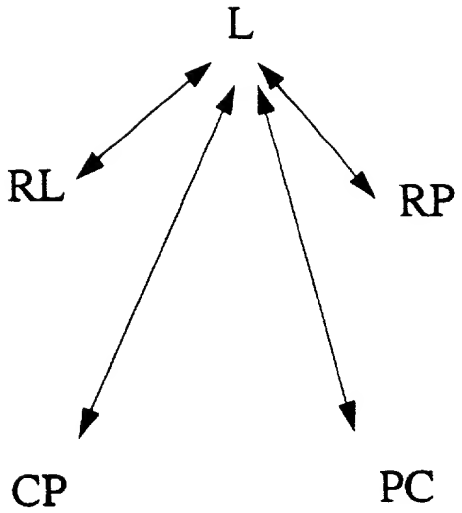


Figure 7B

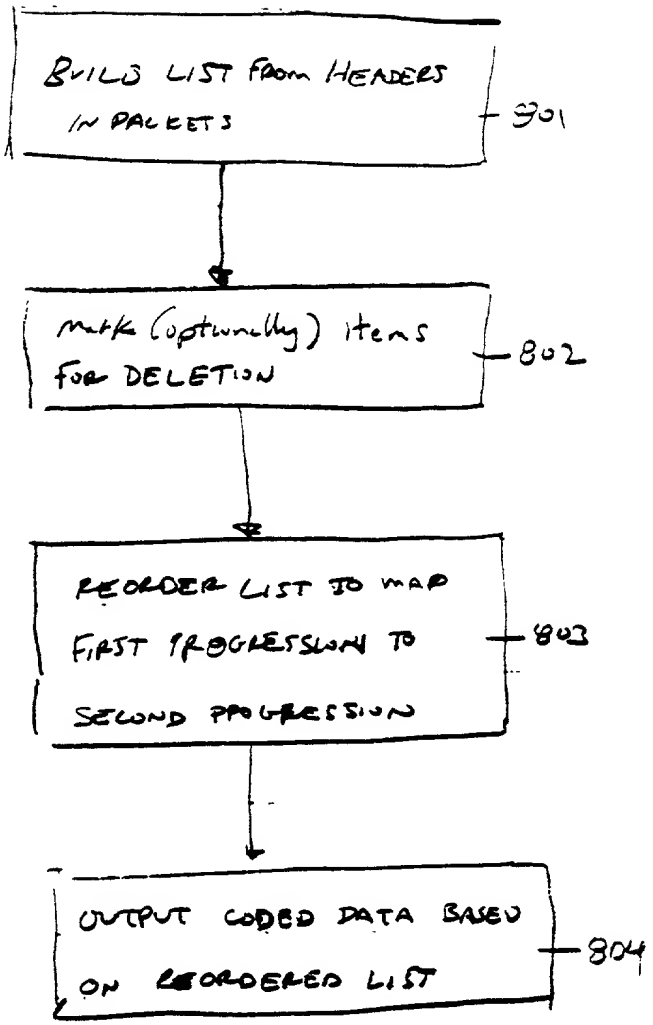

BUILD LIST FROM HEADERS IN PACKETS
801
MARK (OPTIONALLY) ITEMS FOR DELETION
802
REORDER LIST TO MAP FIRST PROGRESSION TO SECOND PROGRESSION
803
OUTPUT CODED DATA BASED ON REORDERED LIST
804

Figure 8

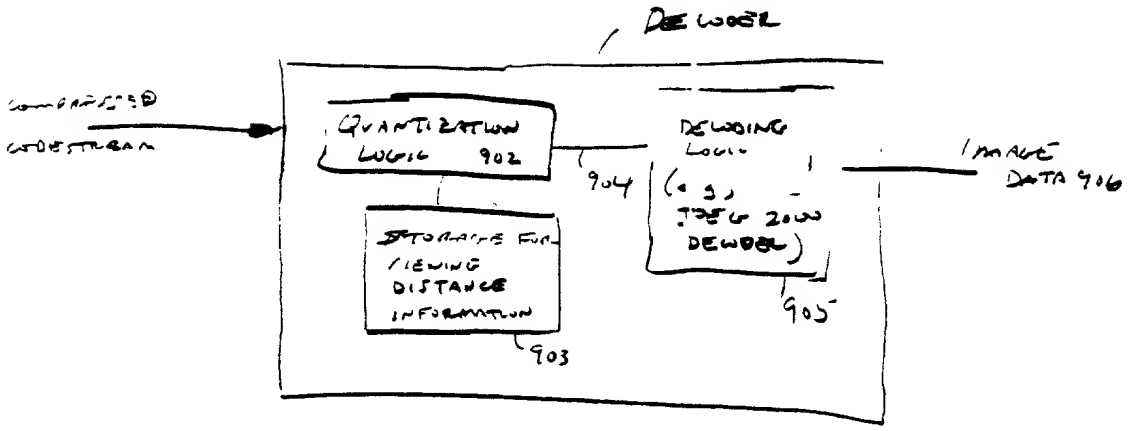


Figure 9

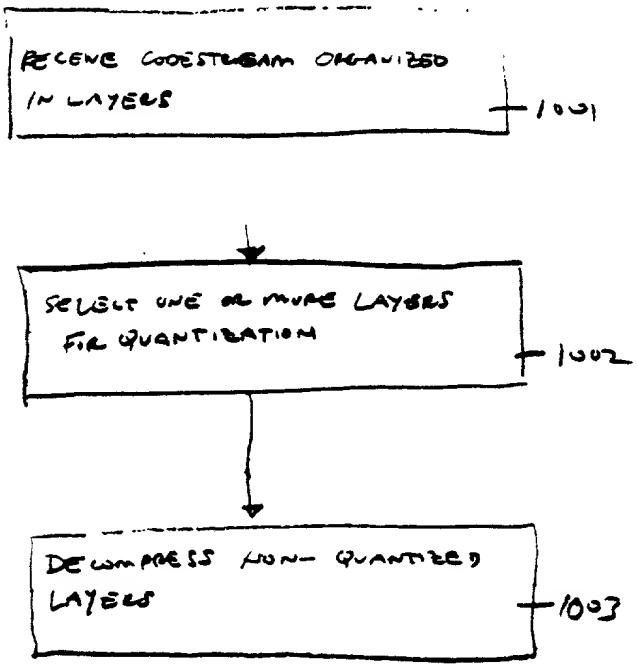


Figure 10

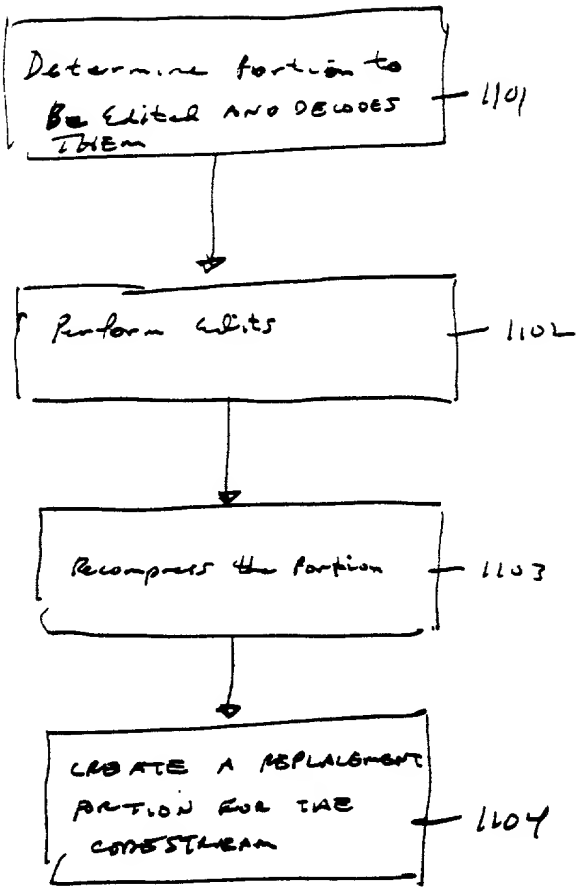

Determine portion to Be Edited AND DECODES THEM
1101
Perform edits
1102
Recompress the portion
1103
CREATE A REPLACEMENT PORTION FOR THE CODESTREAM
1104

Figure 11

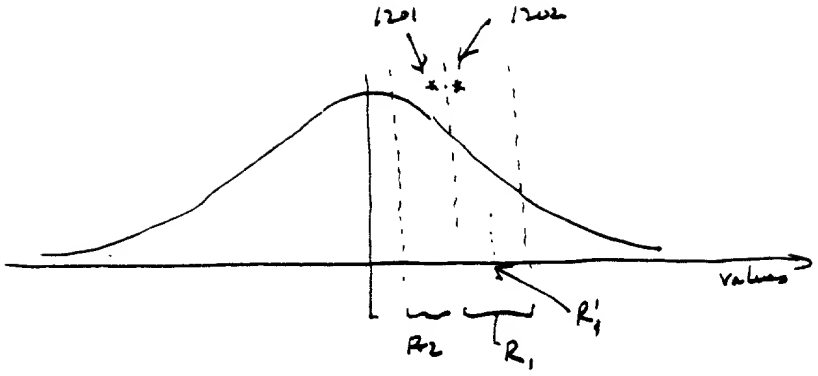


Figure 12

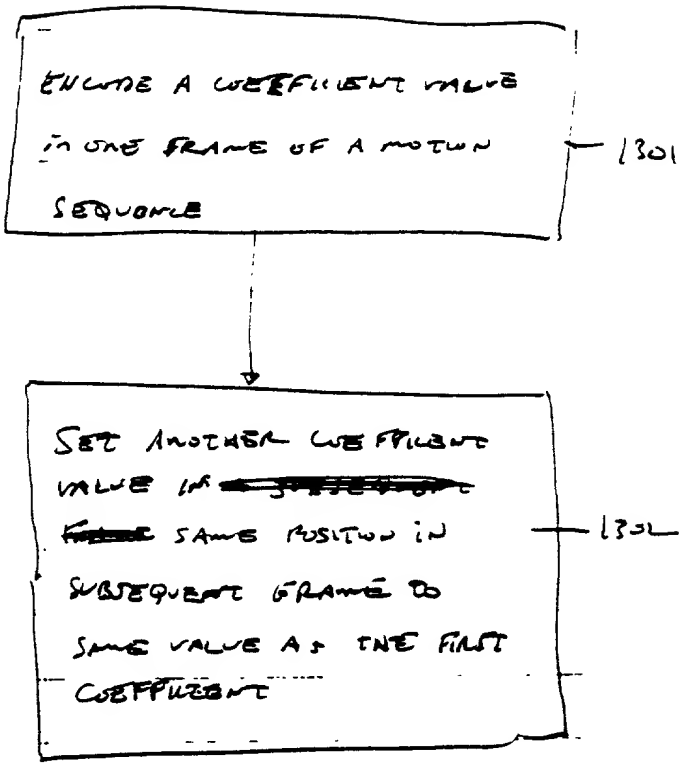


Figure 13

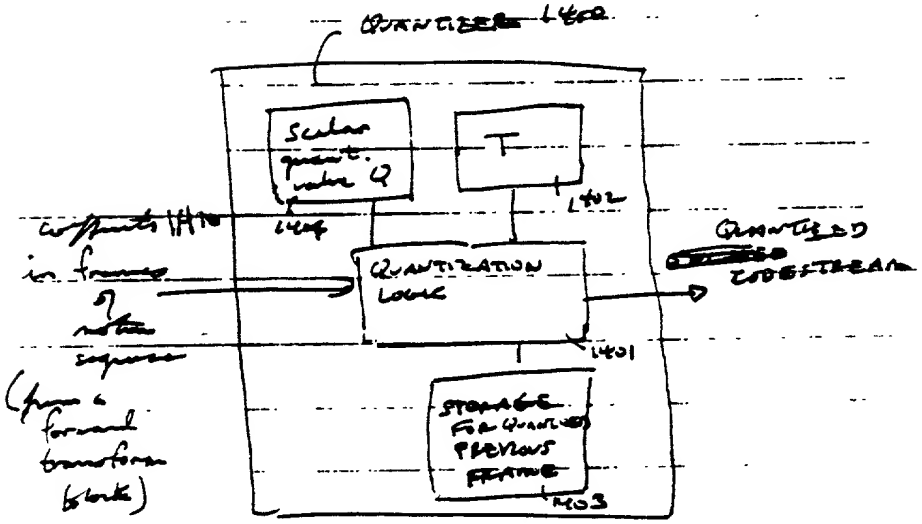


Figure 14

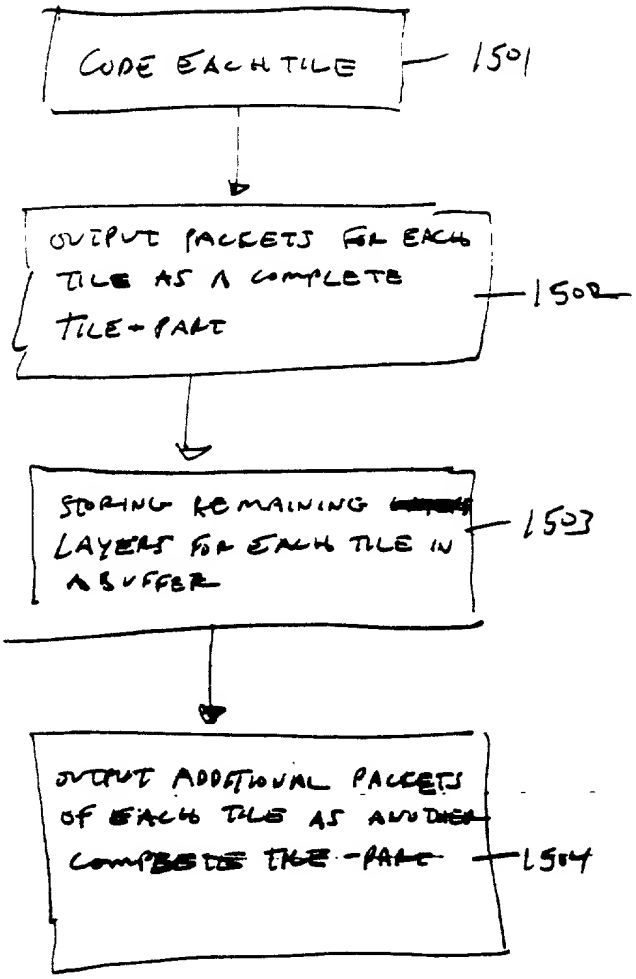

CODE EACH TILE
1501
OUTPUT PACKETS FOR EACH TILE AS A COMPLETE TILE-PART
1502
STORING REMAINING LAYERS FOR EACH TILE IN A BUFFER
1503
OUTPUT ADDITIONAL PACKETS OF EACH TILE AS ANOTHER COMPLETE TILE-PART
1504

Figure 15A

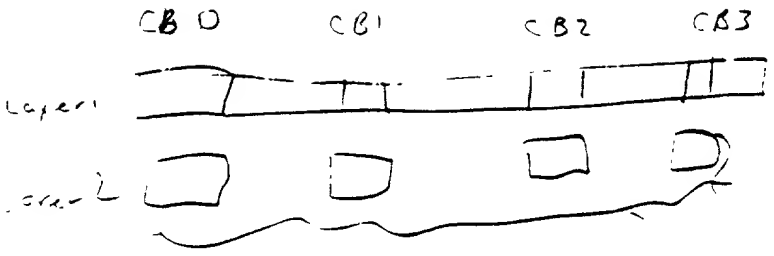


Fig 15B

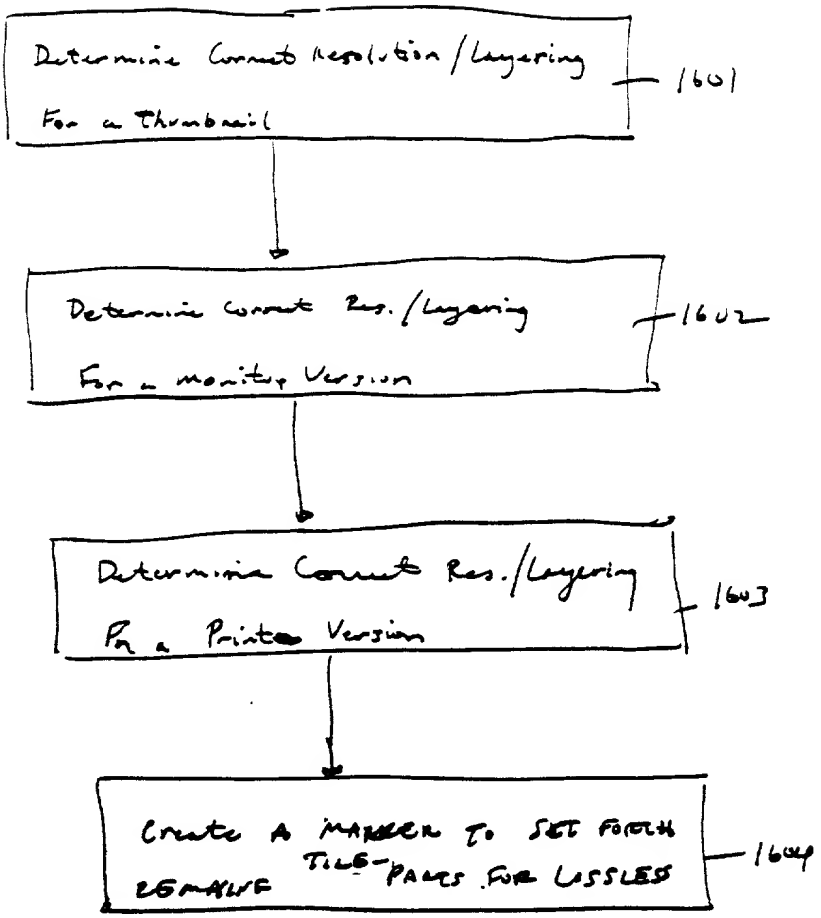

Determine Correct Resolution / Layering
For a Thumbnail
1601
Determine Correct Res. / Layering
For a monitor Version
1602
Determine Correct Res. / Layering
For a Printer Version
1603
Create a MARKER to SET FORTH TILE-PARTS FOR LOSSLESS
REGARDLESS
1604

Figure 16

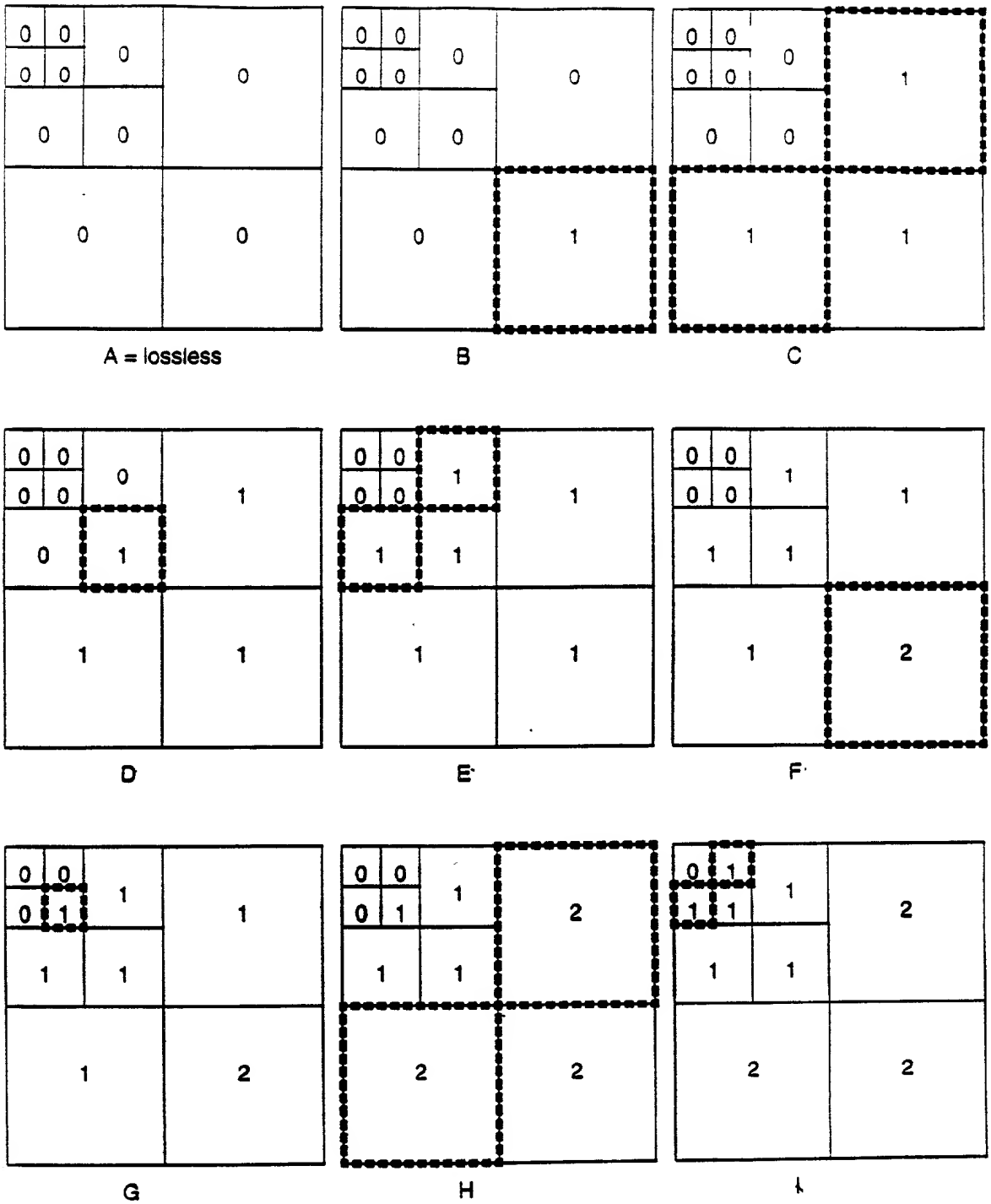


Figure 17

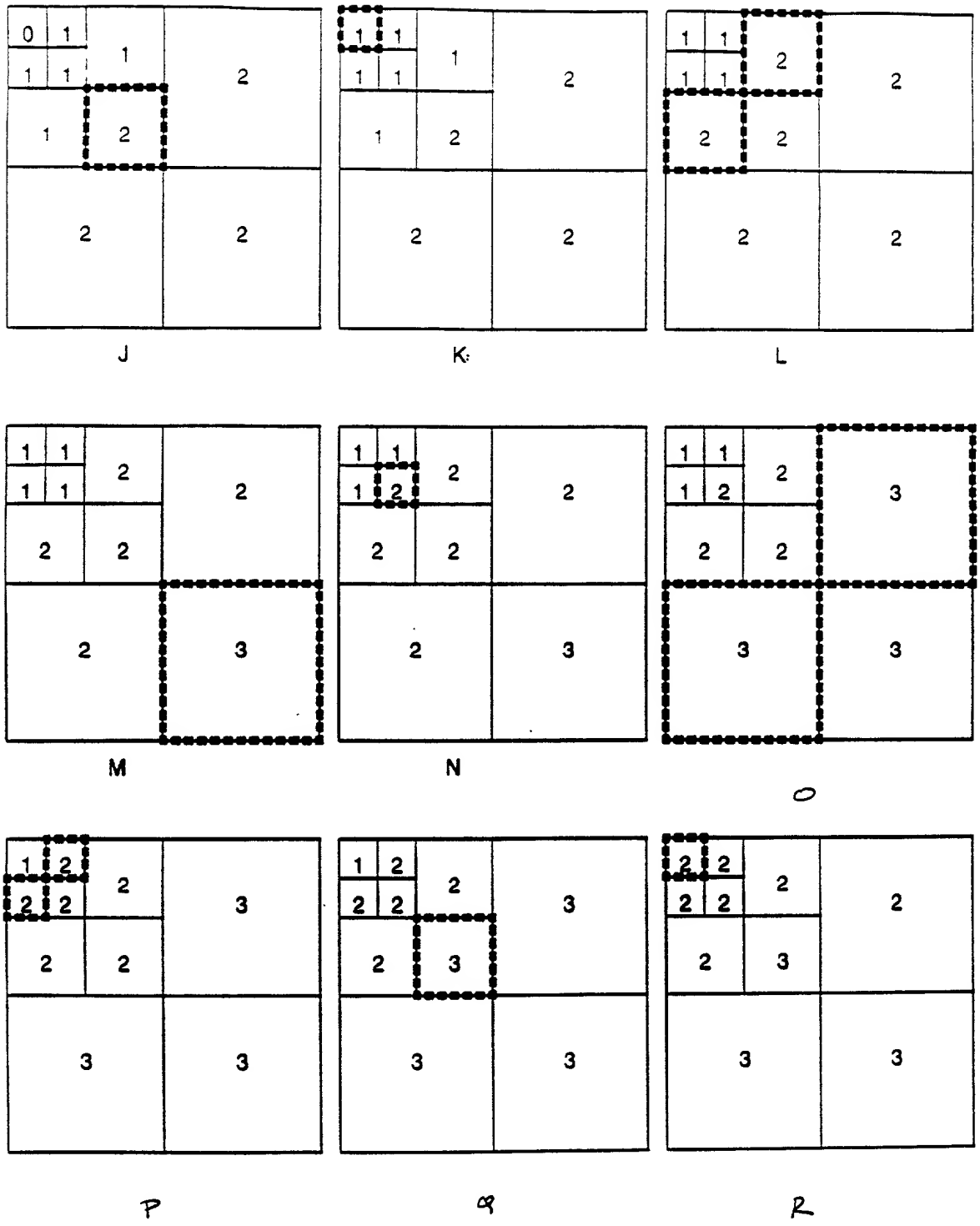


Figure 18

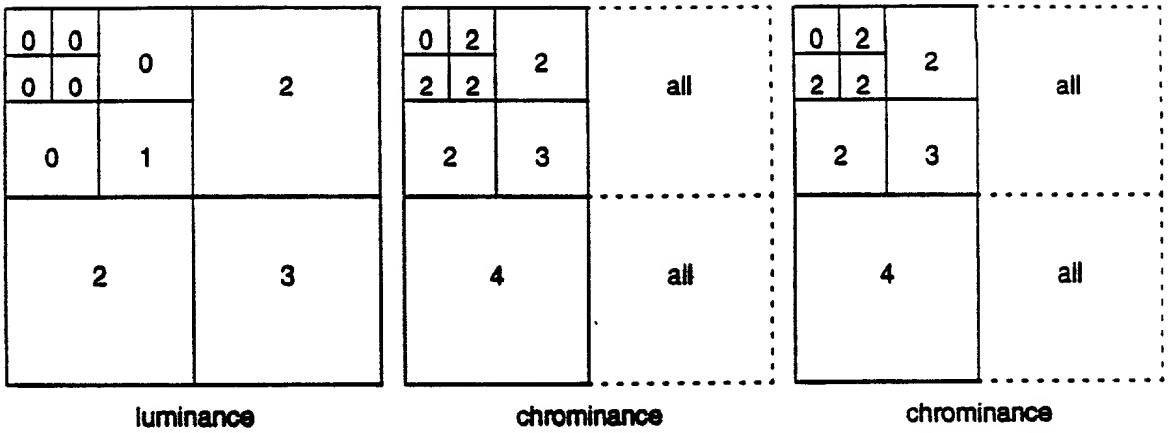

0 0
0 0
0
2
0
1
2
3
luminance
0 2
2 2
2
all
2
3
4
all
chrominance
0 2
2 2
2
all
2
3
4
all
chrominance

Figure 19

2000

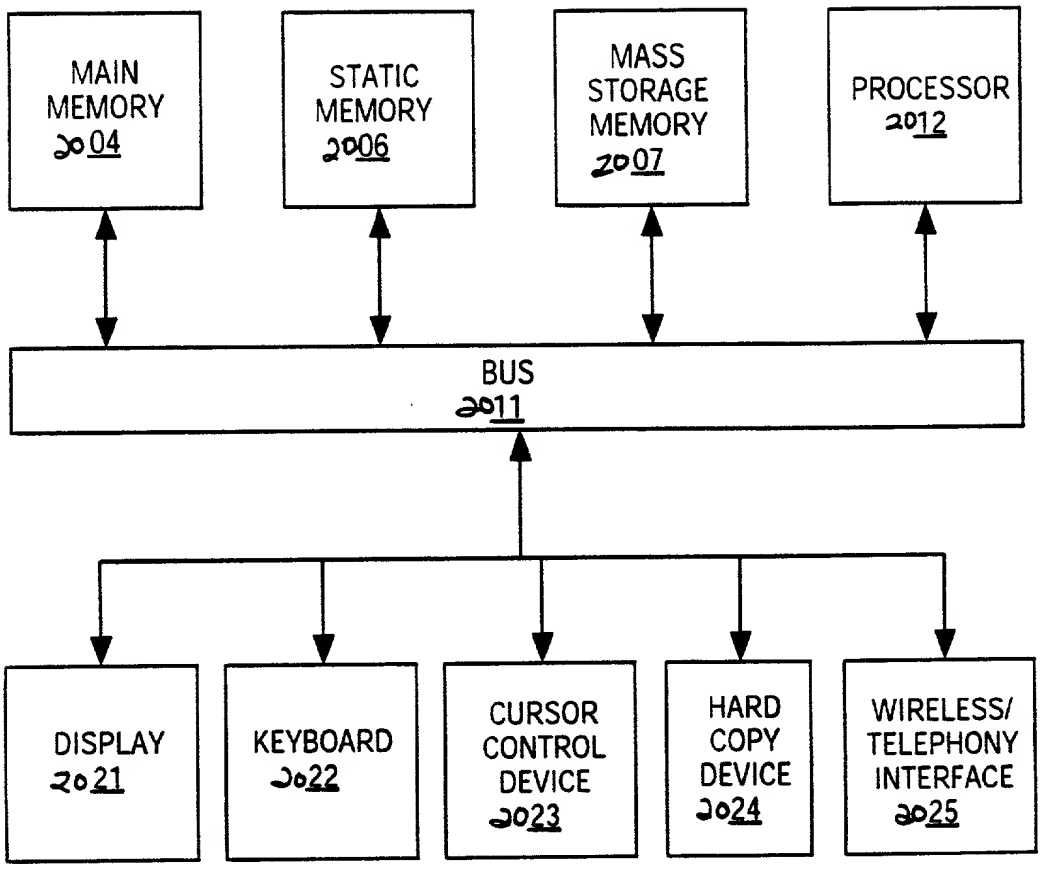

MAIN MEMORY 2004
STATIC MEMORY 2006
MASS STORAGE MEMORY 2007
PROCESSOR 2012
BUS 2011
DISPLAY 2021
KEYBOARD 2022
CURSOR CONTROL DEVICE 2023
HARD COPY DEVICE 2024
WIRELESS/ TELEPHONY INTERFACE 2025

FIG. 20

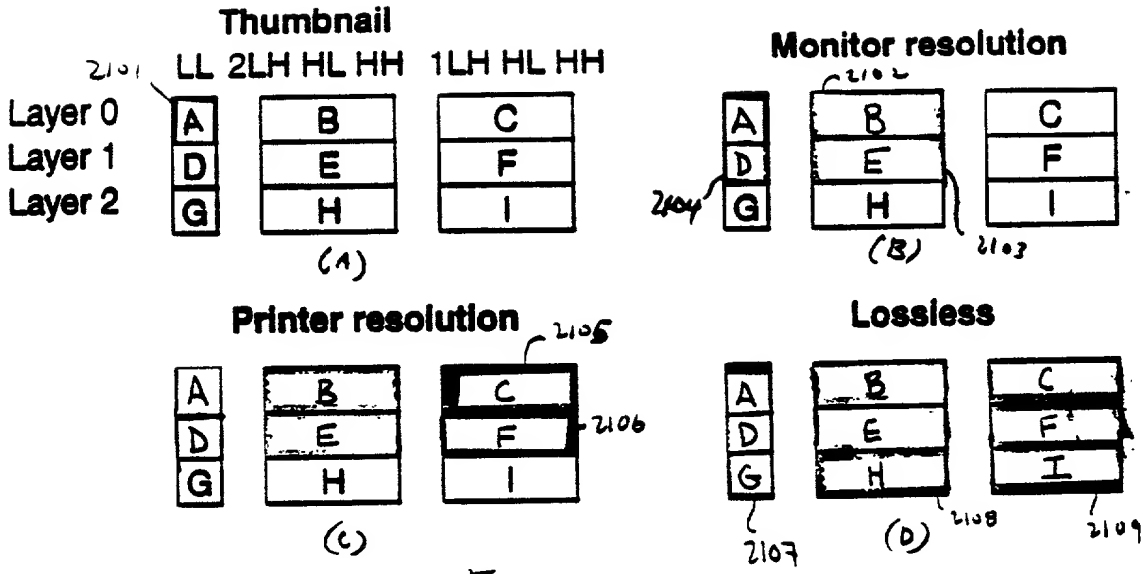

Thumbnail
LL 2LH HL HH 1LH HL HH
Layer 0
Layer 1
Layer 2
A
D
G
B
E
H
C
F
I
(A)
Monitor resolution
(B)
Printer resolution
(C)
Lossless
(D)

Figure 21

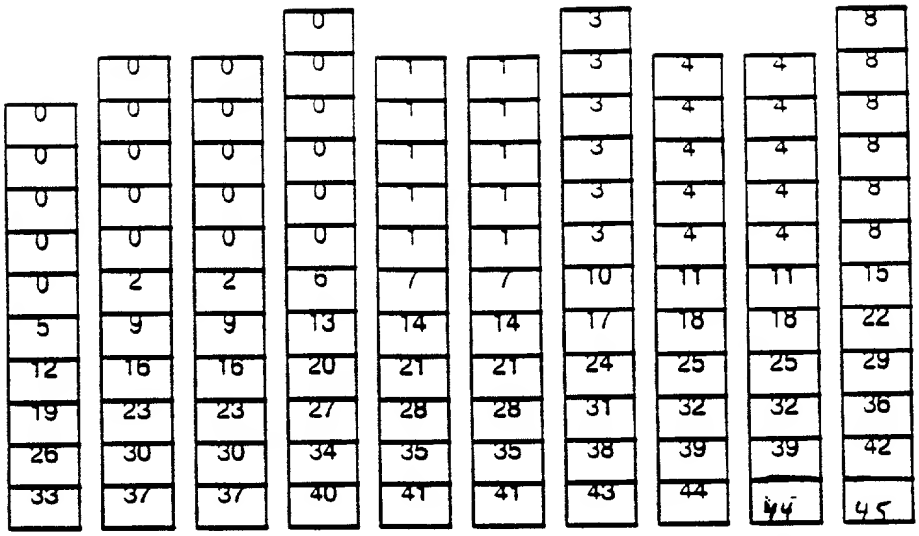


Figure 22

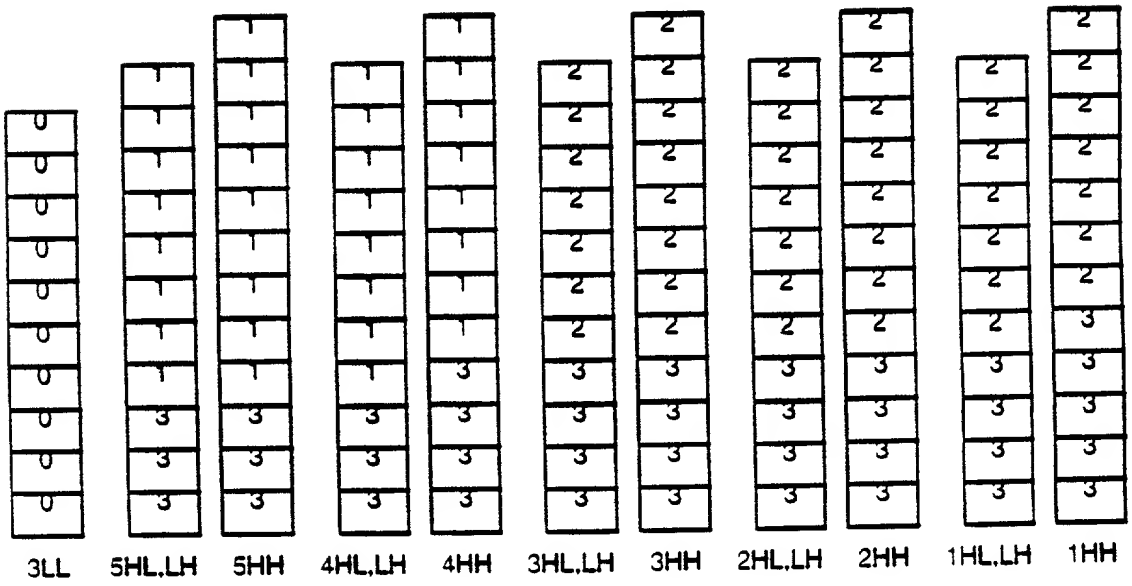


Figure 23

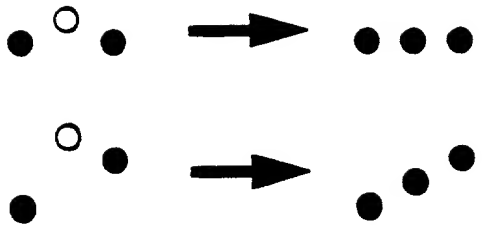


Fig 24

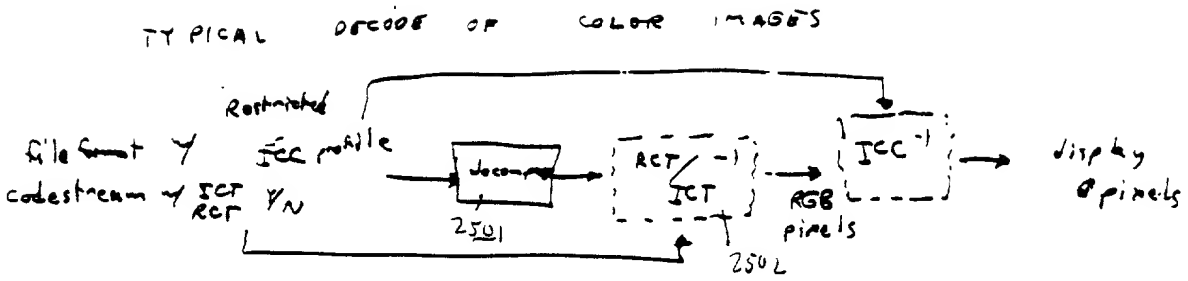


Figure 25

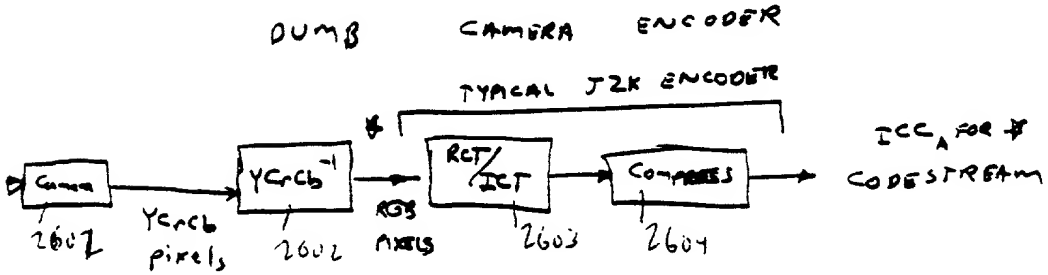


Figure 26

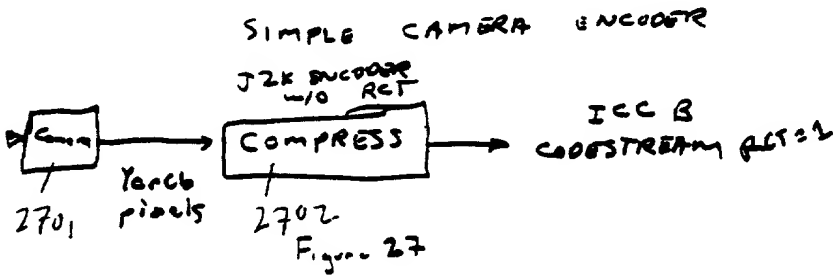


Figure 27

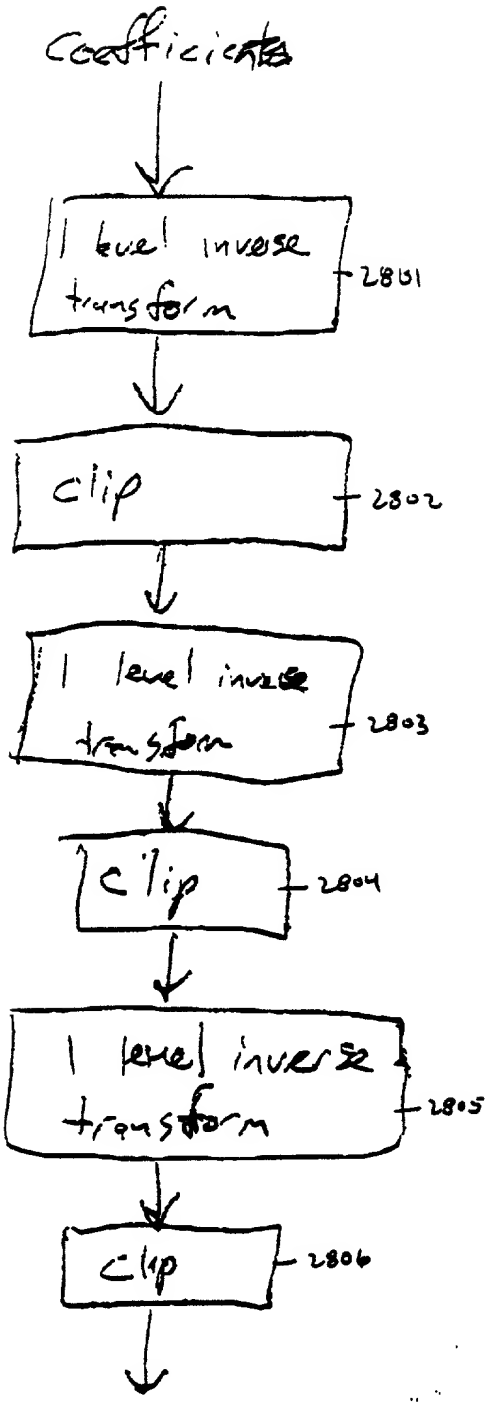

Coefficients
1 level inverse transform
2801
clip
2802
1 level inverse transform
2803
clip
2804
1 level inverse transform
2805
clip
2806

Figure 28